connected to a corresponding contact location and a second end extending outwardly from said surface at a non-orthogonal angle to said surface.

56. (Added) A structure according to claim 55 wherein said non-orthogonal angle is from between 5 degrees and 60 degrees.

57. (Added) A structure according to claim 55 wherein said elongated electrical conductor comprises a bend.

## REMARKS

Support for the amendments to the claims and the added claims are found throughout the specification. Specific non-limiting examples are found in US Application Serial Number 07/963,364 now issued as US 5, 371,654 at Col. 8, lines 50-58 which is incorporated by reference at page 9, lines 7-9 of the present application. Addition support is cited below.

The IDS submitted in the parent application on May 15, 2002 cited US 6,033,393 B1 and US 6,332,149 B1 both of which have an earliest claimed priority date of June 30, 1997. The inventorship of the present application is the same as US 5,371,654 which was cited as a 35 USC 102(e) reference in the parent application. Since the present application is a CIP of US 5,371,654 and has the same inventorship it is not a 35 USC 102(e) reference.

The present application has an earliest Claimed priority date of April 30, 1993 and International Application PCT/US97/16265, from which the present application claims priority, has a priority date of September 13, 1996, both of which are earlier than the priority date of both US 6,033,393 B1 and US 6,332,149 B1. PCT/US97/16265 shows structures (in particular see Figs. 12 and 16) substantially the same as the structures shown in US 6,332,149 B1. The publication corresponding to PCT/US97/16265 is in Attachment C and since it claims priority from US Provisional Application 60/026,112

filed September 13, 1996, the present application has a priority date before US 6,033,393 B1 and US 6,332,149 B1.

The IDS submitted in the parent application on May 15, 2002 cites US 3,806,801 to Bove et al. Bove et al. neither anticipates nor renders obvious the claims of the present application for the following reasons.

This application is a CIP of US Application Serial No. 08/055,485 (Application '485) filed on April 30, 1993, now issued as US Patent 5,635,846, which teaches at page 12, second, paragraph:

> When the wire 130 is severed there is left on the surface 122 of pad 106 an angled flying lead 120 which is bonded to surface 122 at one end and the other end projects outwardly away from the surface. A ball can be formed on the end of the wire 130 which is not bonded to surface 122 using a laser or electrical discharge to melt the end of the wire. **Techniques for this are described in copending U.S. patent application Ser. No. 07/963,346, filed Oct. 19, 1992, which is incorporated herein by reference above.** (emphasis added)

The '485 specification teaches at page 13, lines 4-5, from bottom: **"the wires to flex under pressure** so that the probe ends in contact with the pad will move to wipe over the pad so that good electrical contact is made therewith.." (emphasis added) Flexing is described in detail in US 5,371,654, which is incorporated by reference herein.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 1, line 67- Col. 2, line 2:

"Another object of the present invention is to provide such a packaging structures with both horizontal electrical interconnections and **compliant vertical electrical interconnections."**

As shown below compliant means to deflect under a force and to substantially return to the original shape when the force is removed.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 2. lines 3-6:

"A further object of the present invention is to provide such **structures which can be assembled and disassembled** into a plurality of subassemblies."

The purpose of being "assembled and disassembled" is for the structure to be reusable. To be reusable the elongated electrical conductors which under a force move away from the original position substantially return thereto when the force is removed.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 2, lines 9-11:

"Yet another object of the present invention is to provide such structures which **does not require rigid electrical interconnection** between subassemblies."

The non-rigid property results from the compliance of the elongated electrical conductors.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 6, lines 39-58:

> "FIG. 6 shows substrate 94 and 96 pressed towards each other as indicated by arrows 98 and 100 with interposer 80 therebetween. The elastomer 82 acts as a spring to push the enlarged end contact surfaces 90 and 92 against mating contacts 104 and 106 on substrates 94 and 96 respectively. Surface 102 of substrate 94 has contact locations 104 which are typically metallized pad. Substrate 96 has contact locations 106 which are also typically metallized pads. **When substrate 94 is pressed towards substrate 96 the ends 90 and 92 move laterally with respect to the contact surface because conductors 84 are at a nonorthogonal angle with respect thereto. This lateral movement results in a wiping action which breaks a surface oxide which is on the surface of the contact locations 104 and 106 and which is on the surface of the enlarged ends 90 and 92. The wiping action makes a good electrical contact between the enlarged surface 90 and 92 and the contact locations 104 and 106, respectively.**

The wiping results from the compliance of the elongated electrical conductor moving away under a force from the original position to which it substantially returns when the force is removed. This is a result of the compliance of the elongated electrical conductor.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 4, lines 47-54:

> Substrate 8 is held in grooves in heat dissipation means 51 and 53 to ensure good thermal contact, mechanical support and **compresses the**

**interconnection means** 49 between adjacent assemblies to provide electrical interconnection therebetween as described herein below.

The compressing is what provides the force which results in the compliant elongated electrical conductor deflecting away from the original position and the compliance is what results in the elongated electrical conductor substantially returning to the original position when the force is removed.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 5, lines 3-11:

The structure of FIG. 1 is **compressed** from the top and bottom of the structure **to compress the electrical interconnection means** 46 between the adjacent assemblies pressing electrical contact locations 30 on substrate 8 in contact with electrical contact locations 50 on electrical interconnection means 49 and pressing electrical contact locations 54 on electrical interconnection means 49 in contact with electrical contact locations 18 on the surface of the thin film wiring layer 12.

The compressing is what provides the force which results in the compliant elongated electrical conductor deflecting away from the original position and the compliance is what results in the elongated electrical conductor substantially returning to the original position when the force is removed.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 6, lines 4-6:

The **electrical interconnection m ans 49** can be fabricated to be approximately 1 millimeter thick with 10 percent **compliance**.

The elongated electrical conductors are compliant, that is they move away from the original position upon application of a force and substantially returns to the original position when the force is removed.

US 5,371,654, which is incorporated by reference teaches (emphasis added):

Col. 6, lines 20-21:

> "**The connection is separable**."

The purpose of seperability is to reuse the connector. The connector is reusable only if the elongated electrical conductors move away and substantially return to the original position upon application and removal of a force.

The last sentence of the originally filed abstract reads:

> "The ends of the plurality of conductors in the electrical interconnection means are fabricated so that **upon compression between adjacent assemblies there is a wiping action between the conductor ends and contact locations on the adjacent assemblies to form a good electrical contact therewith**."

The wiping action results from the elongated electrical conductor moving away from their original position upon application of a force which results from moving the elongated electrical conductor against a surface. Since the elongated electrical conductor is compliant it substantially returns to the original position when the force is removed such as when the connection is separated, for example, when the elongated electrical conductor is moved away for the surface.

The International Dictionary of Electronics (1956) at page 342 (See Attachment A) defines "Flexture" as "[a] term which is used to devote the curved or bent state of a loaded beam ... In flexure, an elastic structural material undergoes or deflection sufficient to set up in its material stresses which will support the load." And at pages 274-275, Elasticity is defined as "[t]he property whereby a body, when deformed, automatically recovers its normal configuration as the deforming forces are removed."

Thus a elongated electrical conductors which flex under a force move away from an original position and substantially return to the original position when the force is removed.

Webster's Third New International Dictionary (1981) page 465 (See Attachment B) defines "compliance" to mean "3: the quality or state of yielding to bending under stress within the elastic limit," that is there is substantially no deformation.

Thus a elongated electrical conductors which flex under a force move away from an original position and substantially returns to the original position when the force is removed. When the compliant material is bent beyond the elastic limit it buckles, deforms or crumples.

Bove et al. (US 4,078,599) cited in the IDS teaches away from applicants' claimed invention since Bove et al. teaches buckling which is stressing a beam beyond the elastic limit. This is not flexure or compliance. Bove et al. teaches wires 16 that are straight and perpendicular to substrate 14. (See Fig. 2 of Bove et al.). This, configuration results in the wires 16 being compressed when the wires 16 are pressed against a device under test. Since the wire is straight and perpendicular, the end of the wire that is pressed against the device under test remains fixed in position and the wire buckles. In contradistinction, Applicants' claim conductors with free ends which flex or compliantly move when pressed against a surface. There is no such teaching in Bove et al. A buckling beam test probe assembly, such as taught by Bove et al., is shown in US 5,367,254. (See Attachment D) In US 5,367,254 when end 12 of wire 6 is pressed

against a pad 3 on substraight 4 the straight wire 6 becomes buckled wire 5 and thus is not flexible or compliant. Since the wire 6 buckles to become wire 5 when the end 12 is removed from contact with pad 3, the wire 5 remains buckled and does not return to the original shape and position of wire 6. The elongate conductors of the present invention are preferably shaped so that they compliantly move or flex when pressed against the area of the electronic device. There is clearly no such teaching in Bove et al.

Element 19 of Bove is not a flexible or compliant element. Bove et al. provides no description of "probes 19" other than to call "19" a probe. At Col. 5, lines 10-21, Bove et al. states "[t]he assembly of probes maybe similar to, or patterned after the probe assembly disclosed ... in ... Bove US Patent No. 3,806,801.", which is entitled "Probe Contactor Having Buckling Beam Probes". The American Heritage Dictionary, Second College Edition, defines buckle to mean "to cause to bend, warp or crumple". US Patent 5,367,254 shows a picture of a buckled beam. See the copy of this patent enclosed with the IDS and the figure therefrom in Attachment D which shows a buckled beam 5 in the figure thereof. In contradistinction, all of Applicants' claims recite flexible or compliant conductor or similar recitation. Bove et al. '599 teaches away from all of Applicants' claims since it teaches "buckling beams which warp or crumple". A crumpled beam cannot flex within the scientific meaning of the term described above. Fig. 8 of US Patent 3,806,801 (referred to by Bove et al.) shows graphically the relationship of force and deflection of an axially loaded probe as taught in Bove et al. '599. The buckling of this probe is described at Col. 1, lines 54-64 and Col. 6, lines 10-35 of US 3,806,801, in particular, Col. 6, lines 27-30 teaches, "The wire 16 of the probe 15 is designed in accordance with formula ... where F is an axial load on the end of the wire 16 which will cause buckling of the wire 16." It is thus clear that Bove et al. US Patent 4,038,599 does not teach or suggest a flexing conductor, but in fact teaches away since it teaches a buckled conductor.

Please charge any fee necessary to enter this paper and any previous paper to deposit account 09-0468.

Respectfully submitted,

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